U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

Date: OCT 3 1 1969

Reply to
Attn of: 610.00

Executive Registry

69-5505

Subject: Status Report on Development of Standards for Keyboard Arrangements
and Request for Agency Advice and Comments

To: Federal Departments and Agencies

In March of 1968, we wrote to Federal departments and agencies asking
for comments on two proposed USA keyboard standards being ballotted
upon in American National Standards Committee X4 (at that time USA
Standards Committee X4):

(1) Proposed USA Standard USASCSOCR Dual Case Keyboard Arrangement

(2) Proposed USA Standard General Purpose Alphanumeric Keyboard
     Arrangement for Information Interchange.

The first proposed standard was for preparing documents to be read by
optical character recognition equipment and the second for preparing
character codes. Out of twenty some agencies responding, the overwhelming
majority advised a negative vote on both ballots. In accordance with this
advice, as well as our own convictions, we voted negative.

The primary substantive reason behind the negative vote was that the two
proposed keyboard standards differed appreciably from each other and also
from the existing USA typewriter keyboard standard, X4.7-1966 American
Standard Typewriter Keyboards. Furthermore, neither keyboard arrangement
provided for all of the ASCII (FIPS 1) characters, or even all of the
ASCII graphics. The final count of ANSI X4 ballots on the proposed OCR
keyboard [(1) above] was 8 affirmative, 7 negative, and 10 (?) not voting
or abstaining. On the general purpose keyboard for information interchange
[(2) above], it was 9 affirmative, 6 negative, and 10 (?) not voting or
abstaining. In view of these rather inconclusive results, both proposals
were sent back to the technical subcommittee X4-A9 for further work.

After much additional labor and several successive unacceptable draft
proposals, a new proposal was accepted by X4 members for letter ballot.
The title of the new document is "Proposed USA Standard Alphanumeric
Keyboard Arrangements Accommodating the Character Sets of the USA Standard
Code for Information Interchange and USA Standard Code for Information
Interchange and USA Standard Character Set for Optical Character Recognition",
Document X4/65, and the ballot on it closes on November 23, 1969.

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Figure 1, the bit-paired keyboard arrangement, and Figure 2, the typewriter paired keyboard arrangement, from X4/65 are attached hereto. Both figures provide for all the graphic characters of the ASCII character set; consequently, these arrangements are more complete than those considered last year. Also, Document X4/65 specifies locations for ASCII controls "inboard" and "outboard" of the alphanumeric sections. In addition, the document provides for substitute locations for OCR-A symbols in each of the two alternative arrangements. Both Figures 1 and 2, then, are intended to implement the ASCII character set with neither figure intended for use in an application not also serviceable by the other figure.

The terms bit-paired and typewriter-paired are only partially descriptive. Both proposed keyboard arrangements follow both bit-pairing and typewriter-pairing so long as these requirements are not in conflict with each other. This covers the entire alphabetic (QWERTY) part of the keyboard as well as many of the keys for punctuation marks and special symbols. Where these requirements are in conflict, however, the bit-paired keyboard has favored compatibility with the standard electric typewriter keyboard of X4.7-1966.

Both keyboards have rules for subsetting so as to fit conventional 46, 45, and 44 key correspondence typewriter keyboards. Section 2 of Document X4/65 is attached hereto. Paragraph 2.2 and its subparagraphs give the subsetting rules for the bit-paired keyboard while paragraph 2.3 and its subparagraphs give the subsetting rules for the typewriter-paired keyboard. Neither keyboard arrangement is well adopted to subsetting for 64 or 16 character ASCII subsets. Since such subsets are being considered for Federal standardization, keyboards for subsets are still an open problem.

Although it is recognized that a single ASCII standard keyboard arrangement would be preferable to two alternative ones, the ANSI committee and subcommittee responsible (X4 and X4.A9 respectively) have been unable to propose one. The alternatives given in Figures 1 and 2 appear to be as close as they can come to it. The supporters of the bit-paired keyboard arrangement hold that the logical bit-pairing is necessary for reasons of economy of manufacture while the supporters of the typewriter-paired keyboard arrangement consider that maximum compatibility with conventional typewriter keyboards is the dominant consideration.

Your advice and comments are solicited on two questions relative to this keyboard standard. First, considering that NBS is representing your agency's interests, how should NBS vote on the proposed USA standard for keyboard arrangements, Document X4/65? In view of the long history of development of this document, it would seem to be useless to send it back for rework again unless new guidelines can be given.

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Second, assuming that the document is accepted as an American National
Standard (or even if it isn't), should all or part of it be adopted as a
Federal standard? The Federal Government could, for example, (1) adopt
either Figure 1 or Figure 2 rather than both, or (2) eliminate some of
the options given in Attachment 3.

Inasmuch as X4/65 is now in 60-day letter ballot period as a proposed USA
standard, will you kindly advise us regarding the first of the above
questions on or before November 20, 1969. In view of the short time
available, oral replies, to be confirmed later, will be accepted. Please
call Mr. Don Heiser, 164-3545. Written confirmation to your replies to
question one and replies to question two should be received within two
months of the date of this letter.

Complete copies of X4/65 (28 pages) are not yet available. They will be
sent to you automatically when they are. However, do not delay your
responses to question 1 for them since they may not be ready in time.

H.R.J. Grosch
Director
Center for Computer Sciences
and Technology

3 Attachments:
(1) Figure 1, Keyboard Arrangement from Proposed USA Standard X4/65
     (bit-paired)
(2) Figure 2, Keyboard Arrangement from Proposed USA Standard X4/65
     (typewriter-paired)
(3) Standard Keyboard Arrangements (Section 2 of proposed USA Standard)